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IS 6386 (1971): Beta-APO-8'- Carotenal, Food Grade [FAD 8: Food Additives]



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*Indian Standard*  
SPECIFICATION FOR  
BETA-APO-8'-CAROTENAL, FOOD GRADE

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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 1

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Gr 2

# *Indian Standard*

## SPECIFICATION FOR BETA-APO-8'-CAROTENAL, FOOD GRADE

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# *Indian Standard*

## SPECIFICATION FOR BETA-APO-8'-CAROTENAL, FOOD GRADE

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 31 December 1971, after the draft finalized by the Food Additives Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** This standard is one of the series of Indian Standards on natural food colours permitted under the Prevention of Food Adulteration Rules, 1955.

**0.3** In preparing this standard, considerable assistance has been derived from the 'Specification for identity and purity, toxicological evaluation of food colours', Report Series No. 38 B, published by FAO/WHO, Rome, 1966.

### 0.4 Description

**0.4.1** *Common Name* — Beta-apo-8'-carotenal.

**0.4.2** *Colour* — Orange to red in oils and organic solvents.

**0.4.3** *Class* — Carotenoid.

**0.4.4** *Colour Index*

a) DFG Lebensmittel — orange 8.

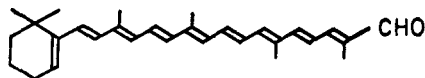
b) EEC No. E 160e.

**0.4.5** *Chemical Name* — Trans-beta-apo-8'-carotenal.

**0.4.6** *Empirical Formula* —  $C_{30}H_{40}O$ .

**0.4.7** *Molecular Weight* — 416.65

**0.4.8** *Structural Formula*



**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## **1. SCOPE**

**1.1** This standard prescribes the requirements and methods of test for beta-apo-8'-carotenal, food grade.

## **2. REQUIREMENTS**

**2.1 General**—Beta-apo-8'-carotenal shall be deep violet crystals with metallic lustre. The material for commerce may be solutions in oil, fat or organic solvents or water-dispersible forms such as powders, granules or capsules, and shall be orange to red in colour.

**2.2 Solubility**—It is insoluble in water but soluble in ethanol, vegetable oils and chloroform.

### **2.3 Identification Tests**

**2.3.1 Melting Range**—It shall be between 136°C and 140°C.

**2.3.2 Absorption**—In solution of cyclohexane the absorbance ratio  $A_{488}/A_{461}$  shall be between 0.80 and 0.84.

**2.3.3** The colour of a solution of apocarotenal in acetone shall disappear after the successive additions of a 5 percent solution of sodium nitrite and 1 N sulphuric acid.

**2.3.4** A solution of apocarotenal in chloroform shall turn blue on addition of excess of antimony trichloride (Carr-Price) reagent.

**2.4** The material shall also conform to the requirements given in Table 1.

## **3. PACKING AND MARKING**

**3.1 Packing**—The material shall be packed in air-tight containers gassed with nitrogen.

**3.2 Marking**—Each container shall be labelled as follows:

- a) Name and type of the material,
- b) Name and address of the manufacturer,

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\*Rules for rounding off numerical values (*revised*).



- c) Minimum net weight,
- d) Batch or code number, and
- e) A statement to the effect that the material should be kept in a cool place.

**TABLE 1 REQUIREMENTS FOR BETA-APO-8'-CAROTENAL**  
( Clause 2.4 )

Sl No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST	
			Ref to Appendix	Ref to Cl of IS : 1699 ( Part I )- 1960*
(1)	(2)	(3)	(4)	(5)
i)	Purity, as $C_{30}H_{40}O$ percent by weight, <i>Min</i>	96	A	—
ii)	Sulphated ash, percent by weight, <i>Max</i>	0.1	B	—
iii)	Arsenic ( as As ), mg/kg, <i>Max</i>	3	—	8
iv)	Lead ( as Pb ), mg/kg, <i>Max</i>	10	—	9

\*Method of sampling and test for coal tar food colours, Part I.

**3.2.1** The containers may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 4. SAMPLING

**4.1** Representative samples of the material shall be drawn as prescribed in Appendix B of IS : 3841-1966\*.

\*Specification for  $\beta$  carotene.

## 5. TESTS

5.1 Tests shall be carried out as prescribed in col 4 and 5 of Table 1.

5.2 **Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water (*see* IS: 1070-1960\*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

## A P P E N D I X A

[ Table 1, Item (i) ]

### DETERMINATION OF PURITY

#### A-1. REAGENTS

A-1.1 **Chloroform** — It shall be purified as follows:

Wash the chloroform thrice with fresh 10 percent aqueous solution of sodium thiosulphate in a separatory funnel. Dry the chloroform with anhydrous calcium chloride, filter, distil the chloroform over anhydrous sodium thiosulphate in an all-glass apparatus with a fractionating column of 70 cm length. Collect only middle fraction of the distillate, discarding the first 10 percent and last 10 percent.

A-1.2 **Cyclohexane** — pure.

A-1.3 **Alcohol** — absolute.

#### A-2. PROCEDURE

A-2.1 The assay should be carried out rapidly, avoiding exposure to air and light. Weigh exactly about 80 mg of apocarotenal in a 100-ml volumetric flask and dissolve by shaking briefly with 20 ml pure chloroform. Make sure that the solution is clear. Make up to volume by the addition of pure cyclohexane. Pipette 5.0 ml of the solution into a 100-ml volumetric flask and make to volume with the cyclohexane. Similarly, dilute 5.0 ml of this solution to 100 ml and measure spectrophotometrically the extinction at the absorption maximum (about 461 nm) comparing it with the solvent (cyclohexane) and utilising cuvettes of 1 cm path-length. Calculate the content using  $E(1 \text{ percent}, 1 \text{ cm}) = 2640$  for pure apocarotenal.

A-2.2 **Modified Method for Water Dispersible Products** — In certain commercial products, such as the water-dispersible powders, apocarotenal is finely dispersed in an appropriate medium, such as gelatin. In such

\*Specification for water, distilled quality (*revised*).

preparations all the apocarotenal shall be separated from the medium before making the spectrophotometric assay, and a correction shall be applied to take account of the difference in absorption of the isomers.

**A-2.2.1** Weigh exactly a quantity of the powder equivalent to about 10 mg free apocarotenal into a thick-walled glass cylinder. Add 10 ml distilled water, displace the air with nitrogen and heat the tube on a steam-bath at 60°C stirring it from time to time with a glass stirring rod, in such a way that the powder is entirely moistened and that the particles do not stick to the walls of the tube. After about 10 minutes a homogeneous suspension of the powder should be obtained. Transfer the contents of the tube to a 250-ml volumetric flask and add 50 ml of absolute alcohol; part of the alcohol should be used to rinse the glass stirring rod and the tube. Add 100 ml of ethyl ether (free from peroxides) rinsing the stirring rod and test-tube again, shake for 3 minutes make up to volume with ethyl ether and mix thoroughly. Let stand for 15 minutes in the absence of light so that the insoluble particles can precipitate. Pipette 5.0 ml of the above solution into a flask, replace the air with nitrogen and evaporate to dryness at about 50°C in a rotary evaporator. After cooling, dissolve the residue in pure cyclohexane, transfer the solution quantitatively into a 100-ml volumetric flask and adjust the volume with cyclohexane. Measure the extinction at the absorption maximum (about 460 nm) with cyclohexane as reference solvent and utilising cuvettes of 1 cm path-length.

### A-3. CALCULATION

**A-3.1** Calculate the content of apocarotenal using  $E$  (1 percent, 1 cm) = 2400. This theoretical value corresponds to the proportion of isomers normally present in these water-dispersible products.

## APPENDIX B

[ Table 1, Item (ii) ]

### DETERMINATION OF SULPHATED ASH

#### B-1. PROCEDURE

**B-1.1** Weigh accurately 1.000 to 2.000 g of the material in a tared crucible. Ignite until thoroughly charred. Cool, then moisten the residue with one millilitre of sulphuric acid, and cautiously ignite until the carbon is completely consumed. Conduct the ignition in a place protected from air currents, and use as low a temperature as possible to effect the combustion of the carbon. When the carbon has completely disappeared, cool the crucible in a desiccator and weigh. Note down the weight as sulphated ash.

# INDIAN STANDARDS

ON

## Food Additives

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1694-1960	Tartrazine	...	...	...	...	...	2.50
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1696-1960	Amaranth	...	...	...	...	...	1.50
1697-1960	Erythrosine	...	...	...	...	...	2.00
1698-1960	Indigo carmine	...	...	...	...	...	3.50
1699 (Part I)-1960	Methods of sampling and test for coal tar food colours,						
	Part I	...	...	...	...	...	3.50
1699 (Part II)-1960	Methods of sampling and test for coal tar food colours,						
	Part II	...	...	...	...	...	1.00
2557-1963	Annatto colour for food products	...	...	...	...	...	2.00
2558-1963	Ponceau 4R	...	...	...	...	...	2.50
2923-1964	Carmoisine	...	...	...	...	...	2.50
2924-1963	Fast red E	...	...	...	...	...	2.50
3827-1966	Riboflavin (lactoflavin)	...	...	...	...	...	2.00
3841-1966	$\beta$ -Carotene	...	...	...	...	...	2.00
4446-1967	Chlorophyll	...	...	...	...	...	4.00
4447-1967	Sodium benzoate, food grade	...	...	...	...	...	4.00
4448-1967	Benzoic acid, food grade	...	...	...	...	...	4.00
4467-1967	Caramel	...	...	...	...	...	2.50
4750-1968	Sorbitol, food grade	...	...	...	...	...	4.00
4751-1968	Potassium metabisulphite, food grade	...	...	...	...	...	3.50
4752-1968	Sodium metabisulphite, food grade	...	...	...	...	...	2.50
4753-1968	Sodium nitrate, food grade	...	...	...	...	...	3.50
4818-1968	Sorbic acid, food grade	...	...	...	...	...	2.50
5055-1969	Lecithin	...	...	...	...	...	5.00
5056-1969	Common names for coal tar food colours	...	...	...	...	...	2.00
5057-1969	Potassium nitrite, food grade	...	...	...	...	...	2.00
5058-1969	Sodium citrate, food grade	...	...	...	...	...	2.50
5191-1969	Sodium alginate, food grade	...	...	...	...	...	3.50
5306-1969	Carboxymethyl cellulose, food grade	...	...	...	...	...	4.00
5342-1969	Ascorbic acid, food grade	...	...	...	...	...	2.50
5343-1969	Butylated hydroxyanisole, food grade	...	...	...	...	...	4.00
5344-1969	Butylated hydroxytoluene food grade	...	...	...	...	...	3.50
5345-1969	Sodium saccharin, food grade	...	...	...	...	...	3.50
5346-1969	Coal tar food colour preparations	...	...	...	...	...	2.00
5707-1970	Agar, food grade	...	...	...	...	...	2.50
5708-1970	Sodium tartrate, food grade	...	...	...	...	...	2.50
5709-1970	Calcium saccharin, food grade	...	...	...	...	...	2.50
5719-1970	Gelatin, food grade	...	...	...	...	...	6.00
6022-1971	Fast green FCF, food grade	...	...	...	...	...	3.50
6029-1971	Wool green BS, food grade	...	...	...	...	...	4.00
6030-1971	Sodium propionate, food grade	...	...	...	...	...	3.50
6031-1971	Calcium propionate, food grade	...	...	...	...	...	3.50
6120-1971	Method of determination of total dye content in food colour preparations	...	...	...	...	...	3.50